The Periodic Table

IA												IIIA	IVA	VA	VIA	VIIA	VIIIA
H 1 1.01	IIA																He 2 4.00
Li 3 6.94	Be 4 9.01											B 5 10.81	C 6 12.01	N 7 14.01	O 8 16.00	F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31	IIIB	IVB	VB	VIB	VIIB	VIIIB	VIIIB	VIIIB	IB	IIB	Al 13 26.98	Si 14 28.09	P 15 30.97	S 16 32.07	Cl 17 35.45	Ar 18 39.95
K 19 39.10	Ca 20 40.08	Sc 21 44.96	Ti 22 47.88	V 23 50.94	Cr 24 52.00	Mn 25 54.94	Fe 26 55.85	Co 27 58.93	Ni 28 58.69	Cu 29 63.55	Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 263)	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)	Ds 110 (271)	Rg 111 (272)	Uub 112 (285)	Uut 113 (284)	Uuq 114 (289)	Uup 115 (288)			

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11

Some Useful And Not So Useful Information:

1 kJ = 1000 J

$N = 6.023 \times 10^{23}\ mol^{-1}$

$c = 2.998 \times 10^{8}\ m.s^{-1}$

$h = 6.626 \times 10^{-34}\ J.s.$

SID _____ Last _____ First _____

Question 1
6 Points

1. Give the **number** of significant figures in: **160** _____
2. **[23.56-2.3]/1.248x10^3**
   Report the answer in the **correct number of significant figures**: _____

Question 2
8 Points

Fill in the blanks in the following table:

Protons	Neutrons	Electrons	Complete Atomic Symbol
			$^{24}_{12}Mg^{+2}$
35	45	36	

Question 3
18 Points

Use the Periodic Table accompanying this exam to answer the following questions:

1. **Name** the only **diatomic gas** in **Group VIA** _____
2. **Symbol** for the **lightest Alkali Earth** element. _____
3. **Symbol** for **transition metal** in **Group IB**, **Period 5**. _____
4. Group **IIA** Metals like to have this **charge**. _____
5. The **Lanthanides** belong to what **Period**? _____
6. Group **VIIIA** are collectively **known** to as: _____

Question 4
5 Points

Eu has two naturally occurring isotopes:

Isotope	Exact Mass	Natural Abundance
^{151}Eu	**150.920**	**47.80%**
^{153}Eu	**152.921**	**52.20%**

What is the average atomic mass of Eu? (Give your answer to **3 decimal places**)

Question 5
4 Points

A sample of citric acid, $C_6H_8O_7$, contains **0.632 mol** of the compound. What is the mass of this sample, in grams? **[Show All Work]**

Question 6
7 Points

An unknown compound is composed of:

C **63.15%** H **5.30%** *O* **31.55%**

It has a molar mass of **456.5g**. Determine the formula of this compound.

[Show All Work]

Question 7
6 Points

Using the smallest whole number integers possible, balance the following chemical equations.

1. ___ $C_3H_6(g)$ + ___ $O_2(g)$ = ___ $H_2O(g)$ + ___ $CO_2(g)$
2. ___ $Fe_2O_3(s)$ + ___ $C(gr)$ = ___$Fe(s)$ + __$CO_2(q)$

Question 8
12 Points

Give the correct name for each of the following ionic compounds.

1. CuS _____
2. $Ca(CO_3)_2$ _____
3. Na_3P _____
4. $Fe_3(PO_4)_2$ _____

Question 9
12 Points

Give the correct formula for each of the following ionic compounds.

1. Ammonium hydroxide _____
2. Iron(II) sulfite _____
3. Potassium chlorate _____
4. Aluminum chromate _____

Question 10
6 Points

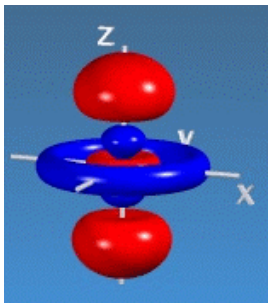
In the visible region of the electromagnetic spectrum, **red** and **blue** light lie at the extremes. Which of these has:

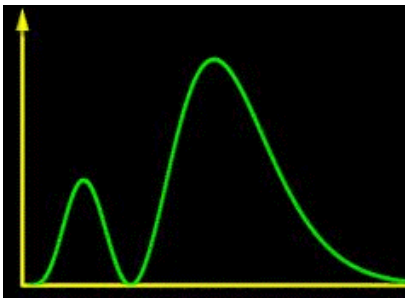
1. The **longest** wavelength: _____
2. The **smallest** frequency: _____
3. The **least** energy: _____

Question 11
7 Points

A chemical reaction can be initiated by light that carries energy of 4.56×10^5 $J.mol^{-1}$. Only light less than a certain wavelength will initiate the reaction.
What is the longest wavelength, in meters, that can deliver the required energy?
[Show All Work]

Question 12
9 Points





1. The orbital depicted above is of what type? _____
2. The n value of this orbital is? _____
3. Its complete designation is? _____

(xy, xz, yz, x^2-y^2, z^2)

Do Not Write Below This Line

Exam I Score